

PATENT ABSTRACTS OF JAPAN

(11) Publication number : 2001-028639

(43) Date of publication of application : 30.01.2001

(51) Int.Cl.

H04M 11/00
H04Q 7/38
H04L 12/28
H04M 1/725
H04N 1/32

(21) Application number : 11-198500

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(22) Date of filing : 13.07.1999

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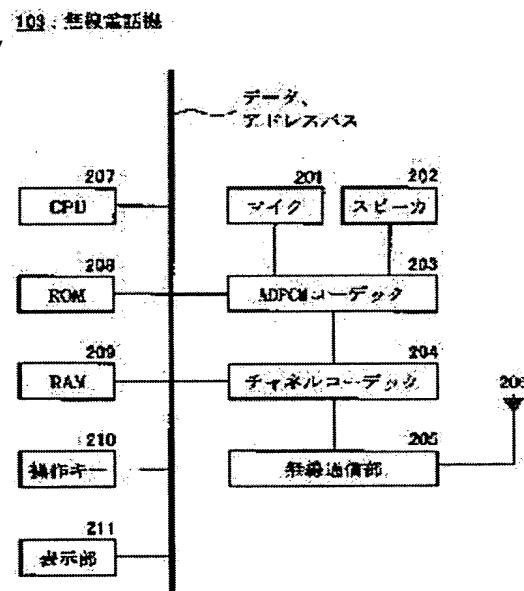
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(54) DATA COMMUNICATION EQUIPMENT AND RADIO COMMUNICATION SYSTEM

(57) Abstract:

PROBLEM TO BE SOLVED: To allow a user to easily obtain a telephone reserving function by connecting calling to be connected to a data communication device, which is connected to a preferred public line, to a radiotelephone set.

SOLUTION: A radiotelephone set 103 has a microphone 201 and a speaker 202 for inputting and outputting voice as a part of its constituent elements. In addition, an ADPCM codec 203 is provided for converting a sound signal inputted from the microphone 201 to an ADPCM code so as to transmit through a radio communication channel and for converting received ADPCM code sound data to an analog signal so as to output from a speaker. In addition, a channel codec 204 converts sound data and information data to data suited to the communication system of a PHS or extracts received data as sound data or information data. An antenna 206 and a radio communication part 205 consisting of electric elements execute radio communication with facsimile equipment.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of

[rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] The data communication unit characterized by having a means to connect the call to connect to the above-mentioned radiotelephone in the radio communications system constituted by the data communication unit connected to the public line of a cable, the radiotelephone connected with this data communication unit by the wireless circuit, and the above-mentioned data communication unit and the above-mentioned radiotelephone.

[Claim 2] The data communication unit characterized by having a means to connect the call to connect to the above-mentioned radiotelephone in claim 1 when a user specifies by the actuation on the above-mentioned data communication unit.

[Claim 3] The data communication unit characterized by having a means to connect to the above-mentioned radiotelephone the call which connects the call linked to the above-mentioned radiotelephone to a data communication unit during the data communication or after data communication termination in claim 1 when reconnecting with a data communication unit.

[Claim 4] The data communication unit characterized by having a means to perform the above-mentioned call change-over actuation in claim 3 when a user specifies by the actuation on the above-mentioned radiotelephone.

[Claim 5] The data communication unit characterized by having a means to connect the call to connect to the above-mentioned radiotelephone, and; when the reply signal of the means and; user call which transmit the signal of a user call is received in any 1 term of claim 1 - claim 4.

[Claim 6] A means to transmit the PRI-Q signal of the means and the;ITU advice T.30 which perform facsimile communication, or a PIP/PIN signal in claim 5 ;P Data communication unit characterized by having a means to connect the call to connect to a radiotelephone, and; when IP / PIN signal, or a PRI-Q signal is received.

[Claim 7] The data communication unit characterized by having a means to connect the call to connect to a radiotelephone, and; when the signal of the means and; user call which receive the signal of a user call is received in any 1 term of claim 1 - claim 6.

[Claim 8] The data communication unit characterized by having a means to connect the call to connect to a radiotelephone, and; when the PIP/PIN signal of the means and the;ITU advice T.30 which perform facsimile communication, or a PRI-Q signal is received in claim 7.

[Claim 9] A means to call the radiotelephone of which; assignment was done with a means to input the information which specifies the previous radiotelephone which connects a call in any 1 term of claim 1 - claim 8; the data communication unit characterized by having a means to connect a call when the called radiotelephone answers, and;

[Claim 10] The information which specifies the previous radiotelephone which connects a call in claim 9 is a data communication unit characterized by being registered beforehand.

[Claim 11] The data communication unit characterized by having a call means to call the specified radiotelephone, and; if the distinction means and the; above-mentioned information which distinguish the informational existence which specifies the previous radiotelephone which connects a call in claim 9 or claim 10 distinguish from owner **.

[Claim 12] A means to call two or more radiotelephones to connect in claim 11 if the above-mentioned information distinguishes that it is nothing; the data communication unit characterized by having a means to connect a call to the radiotelephone which answered among the called

radiotelephones, and;

[Claim 13] The data communication unit characterized by having a means to notify a user of that, and; when there is no information applicable to a means to compare the information which specifies the previous radiotelephone which connects a call in claim 11 with the information registered into the interior of a data communication unit, and the information registered into the interior of; data communication unit.

[Claim 14] The data communication unit characterized by having a means to notify a user of that when the called radiotelephone does not answer in any 1 term of claim 1 - claim 13.

[Claim 15] The radio communications system characterized by the above-mentioned data communication unit having a means to connect the call to connect to the above-mentioned radiotelephone in the radio communications system constituted by the data communication unit connected to the public line of a cable, the radiotelephone connected with this data communication unit by the wireless circuit, and the above-mentioned data communication unit and the above-mentioned radiotelephone.

[Claim 16] The radio communications system characterized by the above-mentioned data communication unit having a means to connect the call to connect to the above-mentioned radiotelephone in claim 15 when a user specifies by the actuation on the above-mentioned data communication unit.

[Claim 17] The radio communications system characterized by the above-mentioned data communication unit having a means to connect to the above-mentioned radiotelephone the call which connects the call linked to the above-mentioned radiotelephone to a data communication unit during the data communication or after data communication termination in claim 15 when reconnecting with a data communication unit.

[Claim 18] The radio communications system characterized by having a means to perform the above-mentioned call change-over actuation in claim 17 when a user specifies by the actuation on the above-mentioned radiotelephone.

[Claim 19] The radio communications system characterized by the above-mentioned data communication unit having a means to connect the call to connect to the above-mentioned radiotelephone, and; when the reply signal of the means and; user call which transmit the signal of a user call is received in any 1 term of claim 15 - claim 18.

[Claim 20] A means to transmit the PRI-Q signal of the means and the;ITU advice T.30 which perform facsimile communication, or a PIP/PIN signal in claim 19 ;P Radio communications system characterized by the above-mentioned data communication unit having a means to connect the call to connect to a radiotelephone, and; when IP / PIN signal, or a PRI-Q signal is received.

[Claim 21] The radio communications system characterized by the above-mentioned data communication unit having a means to connect the call to connect to a radiotelephone, and; when the signal of the means and; user call which receive the signal of a user call is received in any 1 term of claim 15 - claim 20.

[Claim 22] The radio communications system characterized by the above-mentioned data communication unit having a means to connect the call to connect to a radiotelephone, and; when the PIP/PIN signal of the means and the;ITU advice T.30 which perform facsimile communication, or a PRI-Q signal is received in claim 21.

[Claim 23] A means to call the radiotelephone of which; assignment was done with a means to input the information which specifies the previous radiotelephone which connects a call in any 1 term of claim 15 - claim 22; the radio communications system characterized by the above-mentioned data communication unit having a means to connect a call when the called radiotelephone answers, and;.

[Claim 24] The information which specifies the previous radiotelephone which connects a call in claim 23 is a radio communications system characterized by registering with the data communication unit beforehand.

[Claim 25] The radio communications system characterized by the above-mentioned data communication unit having a call means to call the specified radiotelephone, and; if the distinction means and the; above-mentioned information which distinguish the informational existence which specifies the previous radiotelephone which connects a call in claim 23 or claim 24 distinguish from owner **.

[Claim 26] A means to call two or more radiotelephones to connect in claim 25 if the above-

mentioned information distinguishes that it is nothing; the radio communications system characterized by the above-mentioned data communication unit having a means to connect a call to the radiotelephone which answered among the called radiotelephones, and;.

[Claim 27] The radio communications system characterized by the above-mentioned data communication unit having a means to notify a user of that, and; when there is no information applicable to a means to compare the information which specifies the previous radiotelephone which connects a call in claim 25 with the information registered into the interior of a data communication unit, and the information registered into the interior of; data communication unit.

[Claim 28] The radio communications system characterized by the above-mentioned data communication unit having a means to notify a user of that when the called radiotelephone does not answer in any 1 term of claim 15 - claim 27.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] This invention relates to the data communication unit in which data communication, such as facsimile apparatus, is possible, a radiotelephone, and the radio communications system constituted from them.

[0002]

[Description of the Prior Art] In recent years, PHS (Personal handy-phone System) is used and the product which wireless-izes a radio communications system and builds telephone systems, such as an extension telephone, is proposed.

[0003] For example, since a user can carry and walk around with PHS telephone small as a radiotelephone, he can hold dial and conversation carry out call origination, or receive a call in, and according to a telephone to an extension or a line wire always anywhere, and is very convenient.

[0004] Moreover, PHS fits not only the use as a simple portable telephone for a message but digital data transmission with sufficient circuit quality. Therefore, the usage of the data communication which used the radio channel of PHS is also proposed.

[0005] On the other hand, generally, it connects with a public line and the spread of facsimile apparatus typical as a data communication unit in which pictorial communication is possible is quite high, and since a manuscript can be transmitted and received easily, the use does not decline, either.

[0006] Moreover, as a data communication unit, current connects a modem to information terminals, such as a personal computer, and the application which transmits and receives data and the file on a personal computer is extended.

[0007] For example, it is possible to build in a telephone function, or to connect external telephone as a typical function of facsimile apparatus, and to use it, cooperating with a facsimile function. It is performed as follows when specifically holding conversation by the user and telephone by the side of partner facsimile apparatus as the so-called "telephone reservation function", connecting the call after facsimile communication.

[0008] Namely, if the depression of the key switch formed in facsimile apparatus at hand is carried out during facsimile communication when requiring the conversation by telephone from facsimile apparatus at hand Facsimile apparatus among the procedure signals specified to the ITU advice T.30 during image data transmission, after transmission or during reception, and after reception A PRI-Q signal, a PIP signal, or an PIN signal is transmitted, and if that the user of the other party takes telephone etc. answers by carrying out, a PIP signal, an PIN signal, or a PRI-Q signal will be received. And facsimile apparatus at hand carries out singing of the beep sound etc. by a loudspeaker etc., a user is called, and if the telephone attached to facsimile at hand is taken, as for a user, the other party and conversation will be attained.

[0009] Moreover, since facsimile apparatus receives a PIP signal, an PIN signal, or a PRI-Q signal during image data transmission, after transmission or during reception, and after reception when there is a demand of the conversation by telephone from a partner's facsimile apparatus, facsimile apparatus at hand carries out singing of the beep sound etc. by a loudspeaker etc., and calls a user. And conversation will become possible if taking the telephone with which the other party user is attached since the other party facsimile apparatus calls a user in response to it by facsimile apparatus transmitting a PRI-Q signal, a PIP signal, and an PIN signal if a user takes the telephone attached to

facsimile at hand etc. answers by carrying out.

[0010] This is a function applicable also about data communication facility with a personal computer etc.

[0011]

[Problem(s) to be Solved by the Invention] By the way, in the data communication unit connected to the public line of a cable, the radiotelephone connected with the data communication unit by the wireless circuit, and the radio communications system constituted from these, facsimile apparatus uses radiotelephones, such as PHS, during facsimile communication, and there is a case where he wants to describe above "a telephone reservation function."

[0012] It also has the case where he wants to use it the inside of data communication, and after data communication, operating the "telephone reservation function" of performing conversation by telephone, when reconnecting to a data communication unit the call connected to a radiotelephone when a user operates it on a data communication unit, a user specifies by the actuation on a radiotelephone and a data communication unit receives the signal of a user call.

[0013] As an example near the above-mentioned demand, it is proposed by JP,9-84113,A, and in a radio communications system, this proposal can switch a circuit to a child communication terminal (facsimile apparatus) side easily with a main phone, after child telephone's receiving a message.

[0014] However, a main phone is surely required for this proposal, and when switching to child telephone from facsimile apparatus, even if it tends to apply the above-mentioned technique, it has the problem that it does not operate well.

[0015] This invention aims at offering the data communication unit and radio communications system with which a call is switched to child telephone from facsimile apparatus, without using a main phone, namely, a user can get a telephone reservation function easily in radiotelephones, such as data communication units, such as facsimile apparatus, and PHS telephone, and the radio communications system constituted by these.

[0016]

[Means for Solving the Problem] The above-mentioned data communication unit has a means to connect the call linked to a data communication unit to the above-mentioned radiotelephone in the radio communications system which this invention consists of with the data communication unit connected to the public line of a cable, the radiotelephone connected with this data communication unit by the wireless circuit, and the above-mentioned data communication unit and the above-mentioned radiotelephone.

[0017]

[The gestalt and example] of implementation of invention Drawing 1 is the block diagram showing radio communications system CS1 which is the 1st example of this invention.

[0018] If a user operates it during facsimile communication in the radio communications system constituted by the radiotelephones 103, 104, and 105 connected with the facsimile apparatus 101 as a data communication unit with which radio communications system CS1 performs facsimile communication connected to the public line 102 of a cable, and this facsimile apparatus 101 by the PHS wireless circuit, after facsimile communication, that call will be connected to radiotelephones 103-105, and a user can do a message with radiotelephones 103-105.

[0019] The communication link of a message etc. is possible for radio communications system CS1 between a radiotelephone, external telephone, etc. through a public line 102 between a radiotelephone and the telephone attached to facsimile apparatus 101 between radiotelephones. Of course, the facsimile communication of facsimile apparatus 101 and the exterior is also possible through a public line 102.

[0020] Although radiotelephones 103, 104, and 105 show only three pieces, you may make it form four or more numbers, and may make it prepare one and two in drawing 1. Each internal configuration is mutually the same.

[0021] Here, each radiotelephone is equipped with the number as which facsimile apparatus 101 specifies each. That is, a user can input the number which specifies a radiotelephone to use when "telephone reservation" is operated. That is, if you want to use a radiotelephone 103, "#01" is inputted, if you want to use a radiotelephone 104, "#02" is inputted, and "#03" is inputted if you want to use a radiotelephone 105. However, if the number of the radiotelephones which facsimile

apparatus 101 connects is one, if facsimile apparatus 101 recognizes this, it is sufficient, and it is not necessary to input the above-mentioned number.

[0022] Radio system presupposes that it is a PHS method. However, you may make it adopt methods other than a PHS method as the above-mentioned radio system like the DECT (Digital European Cordless Telephone) method developed in Europe.

[0023] Drawing 2 is the block diagram showing the configuration of the radiotelephone 103 in radio communications system CS1.

[0024] In addition, the configuration of a radiotelephone 104,105 is the same as that of a radiotelephone 103.

[0025] The microphone 201 with which a radiotelephone 103 outputs and inputs voice, and a loudspeaker 202, In order to transmit the sound signal inputted from the microphone 201 by the radio channel, it changes into the ADPCM code. Or the ADPCM codec 203 changed into an analog signal since the received ADPCM code voice data is outputted from a loudspeaker, The channel codec 204 which extracts the data which changed voice data and information data into the data which suited the communication mode of PHS, or were received as voice data or information data, With the Radio Communications Department 205 which consists of an antenna 206 and an electric element for radio with facsimile apparatus 101 Two or more key switches 210 for actuation, and the display 211 constituted from LCD and LED for a user to check the condition of a radiotelephone etc., ROM208 which stores the program which CPU207 and CPU207 which control the whole radiotelephone are operated, and controls the whole radiotelephone 103, and a parameter, It is easy to be equivalent to the PHS radiotelephone which consists of RAM209 grades which perform primary storing of the parameter which controls the whole radiotelephone, and primary storing of data which are transmitted and received, and is generally used widely.

[0026] Drawing 3 is the block diagram showing the configuration of the facsimile apparatus 101 by the 1st example of this invention.

[0027] Here, facsimile apparatus 101 contains the main phone function of PHS in the facsimile apparatus currently generally used widely, and it improves it so that PHS radio can be performed.

[0028] Namely, CPU301 by which facsimile apparatus 101 controls equipment, RAM303 which stores a parameter required for the actuation of ROM302 and CPU301 which stores the program of device control, or actuation of equipment, data and the image data [transmission and] which receives, a data file, character code formal data, etc., The control panel 304 which operates equipment in order that a user may specify equipment actuation, or displays the condition of equipment, The read station 305 which reads a facsimile transmitting manuscript and a copy manuscript as a color picture or a monochrome image, With the Records Department 306 which prints out a facsimile receiving manuscript, a copy manuscript, or a file manuscript by the color or black and white The communications control unit 307 which connects with the public lines 308, such as control of the communications protocol for facsimile transmission and reception of G3 / G4 grade, transmission and reception and control of a strange recovery of a signal, PSTN, and ISDN, and performs call origination control, call-in detection, etc., The channel codec 309 which extracts the data which changed information data into the data which suited the communication mode of PHS, or were received as information data, With the Radio Communications Department 310 which consists of an antenna 311 and an electric element for radio with radiotelephones 103, 104, and 105 In order to transmit the data which connected with the communications control unit 307 and were received through the communications control unit 307 to radiotelephones 103, 104, and 105, encode in the ADPCM code, or Radiotelephones 103, 104, and 105 are consisted of by the ADPCM codec 312 which decrypts the data of the ADPCM code received through the radio channel to an analog signal.

[0029] Here, when radiotelephones 103, 104, and 105 let a public line 308 pass between radiotelephones and between a radiotelephone and the telephone attached to facsimile apparatus 101 or facsimile apparatus 101 and communicate between a radiotelephone, and an external transmitter and telephone by the PHS radio channel, the channel codec 309 which is the above-mentioned PHS main phone configuration section of facsimile apparatus 101, an antenna 311, the Radio Communications Department 310, and the ADPCM codec 312 are operated, and facsimile apparatus 101 operates as a PHS main phone.

[0030] Here, the "telephone reservation" carbon button which specifies a "telephone reservation"

function is specially prepared in the control panel 304. That is, telephone reservation functions -- as for facsimile apparatus 101, facsimile apparatus 101 will call either of the radiotelephones 103, 104, and 105 or all, if a "telephone reservation" carbon button is pushed by the user during facsimile communication -- operate.

[0031] Moreover, although the configuration of stand-alone facsimile apparatus is shown, if it is equipment with facsimile communication facility, anything are applicable here.

[0032] For example, the facsimile apparatus which carried the hardware which had communication facility on information terminal units, such as a personal computer, and application software with a facsimile function, and was realized may be assumed as the above-mentioned facsimile apparatus. Or what had a facsimile function in I/O devices, such as a copying machine, and a printer, a scanner, may be assumed as the above-mentioned facsimile apparatus.

[0033] Next, actuation of the above-mentioned example is explained.

[0034] Drawing 4 is drawing showing each actuation of the radiotelephone of the radio communications system which is the 1st example, and facsimile apparatus, and the signal sequence between equipment devices.

[0035] Drawing 5 and drawing 6 are the flow charts showing actuation of facsimile apparatus 101.

[0036] That is, drawing 5 and drawing 6 are the control program sequences of the flow chart which shows actuation of CPU301, and CPU301 stored in ROM302 of operation.

[0037] First, in step S501, facsimile apparatus 101 lets a public line 308 pass, and is G3 facsimile transmitting it. That is, the usual G3 facsimile transmission is performed according to the ITU advice T.4 and T.30.

[0038] And in step S502, if a user pushes the "telephone reservation" carbon button on the control panel 304 of facsimile apparatus 101 during facsimile transmission, facsimile apparatus 101 will operate a telephone reservation function after this. Here, a user can input the number which specifies a radiotelephone to use by "telephone reservation." That is, if you want to use a radiotelephone 103, "#01" is inputted, if you want to use a radiotelephone 104, "#02" is inputted, and "#03" is inputted if you want to use a radiotelephone 105. However, if facsimile apparatus 101 recognizes this when the radiotelephone which facsimile apparatus 101 connects is only one, it is not necessary to input the above-mentioned number which carries out specification.

[0039] On the other hand, in step S502, if a user does not push a "telephone reservation" carbon button, facsimile apparatus 101 ends deed actuation for the usual facsimile procedure in step S503.

[0040] As actuation of a telephone reservation function, in step S504, after facsimile apparatus 101 transmits all or a part of **-JI of facsimile transmit data, it transmits the PRI-Q signal specified to the ITU advice T.30 which is a user call signal to the facsimile apparatus of the other party, and tells that "telephone reservation" was carried out to the other party facsimile apparatus. The other party facsimile apparatus carries out singing of the ringing tone, such as a beep sound, from a loudspeaker etc., in order to call the user, if a PRI-Q signal is received. And in the other party facsimile apparatus, if a user takes the telephone which is attached, for example, as for the other party facsimile apparatus, a reply signal (a PIP signal or PIN signal) will be transmitted to facsimile apparatus 101.

[0041] Here, a thing with the "telephone reservation" function which was connected by the radio channel and adopted the method of the above-mentioned example is sufficient as the other party facsimile apparatus and its attached telephone.

[0042] And facsimile apparatus 101 waits for reception of the PIP signal sent from the other party facsimile apparatus, or an PIN signal in step S505.

[0043] When not taking the telephone with which a timer is counted for example, with which a user is attached in the other party facsimile apparatus in step S506 here Since a PIP signal or an PIN signal is not received, if a PRI-Q signal is transmitted twice with a predetermined fixed time interval, for example and a PIP signal or an PIN signal still is not received In step S503, the usual facsimile procedure is performed and actuation of the facsimile apparatus 101 of the above-mentioned example is ended.

[0044] On the other hand, if a PIP signal or an PIN signal is received in step S505, facsimile apparatus 101 will judge that it carried out that the user of the other party facsimile apparatus took telephone etc., and the actuation which calls the user of the side here will be started.

[0045] It searches whether the number which specifically specifies the radiotelephone to call in step S507 first is inputted. That is, in the above-mentioned step S502, if the number (if you want to use a radiotelephone 103 "#01", a radiotelephone 104 if it becomes "#02", a radiotelephone 105 if it becomes "#03") of a radiotelephone to connect by the "telephone reservation" function is inputted after a user pushes a "telephone reservation" carbon button on a control panel 304, it will progress to step S508.

[0046] In step S508, facsimile apparatus 101 searches whether they are that into which the number which specifies the above-mentioned radiotelephone inputted was registered, and a right thing.

[0047] That is, since the numbers which specify these are #01, #02, and #03 supposing the radiotelephones registered so that it may connect with facsimile apparatus 101 on radio, for example are three radiotelephones 103, 104, and 105, these numbers are beforehand registered with facsimile apparatus 101, and are memorized by RAM303. And an input of a user collates the inputted data and the data memorized by RAM303 as mentioned above. If a collating result suits, facsimile apparatus 101 will judge that it is one of the radiotelephones which can be used, and will progress to step S511.

[0048] For example, supposing the wrong radiotelephone number, #05 [for example,], is inputted, facsimile apparatus 101 will recognize it and will notify a user of that in step S509. That is, facsimile apparatus 101 displays the message which means an invalid input by LCD of a control panel 304, or blinks LED which means cautions, or the Records Department 306 is used for it, it outputs an error report, and notifies a user of an invalid input. And in step S503, facsimile apparatus 101 performs the usual facsimile procedure, and actuation of the facsimile apparatus 101 of the above-mentioned example ends it.

[0049] Facsimile apparatus's 101 decision of what a user did not input the number which specifies the radiotelephone to call in step S507 on the other hand for searches whether the number is registered beforehand in step S510. That is, before performing the time of initialization of facsimile apparatus 101, and facsimile communication, a user can register in advance the number of the specific radiotelephone connected at the time of "telephone reservation" functional actuation, and the data is memorized by RAM303. And it searches whether the number data is registered here. If registered, it will progress to step S511. If not registered, the data which specify the radiotelephone to call judge that there is nothing, and progress to step S512.

[0050] If there is nothing, since it searches first whether the number which specifies the radiotelephone to call here was inputted, and it will search whether it registers with facsimile apparatus 101, the priority of the inputted number will be high. What is necessary is just to make reverse control of step S507 and step S510 to make priority reverse.

[0051] In step S511, facsimile apparatus 101 calls a specific radiotelephone. Here, a radiotelephone 103 shall be called noting that number #01 which specify a radiotelephone were inputted or registered in advance. That is, the channel codec 309 and the Radio Communications Department 310 are operated, a radiotelephone 103, a link channel, and a service channel are established, and call setup MESSE 1 JI is exchanged.

[0052] And in step S513, if the response (CONNECT) of a call setup message is received from a radiotelephone 103, facsimile apparatus 101 will judge that the user of a radiotelephone 103 answered, and will transmit the PRI-Q signal showing the ability for the user of the side here to appear in a radiotelephone 103, and talk over the telephone to the other party facsimile apparatus.

[0053] And in step S514, the user of a radiotelephone 103 can telephone to the user of an other party terminal by connecting to a radiotelephone 103 the information channel which had connected between partner facsimile apparatus so far. Here, since the communications control unit 308 has formed the circuit and the direct-current loop formation when the public line 308 was PSTN, connection of a call is not cut. Moreover, since the communications control unit 308 has connected a circuit and D channel when the public line 308 was ISDN, this connection is not cut. Thus, actuation of the facsimile apparatus 101 of the above-mentioned example is ended.

[0054] On the other hand, in step S512, facsimile apparatus 101 calls all the radiotelephones to connect. Here, since three sets of radiotelephones 103, 104, and 105 are connectable, these [all] are called by the method of simultaneous arrival. That is, a call in (all PS calls) is outputted to each radiotelephone from facsimile apparatus 101.

[0055] And in step S513, since a radiotelephone 104 will send a link channel establishment demand, for example supposing a radiotelephone 104 answers if one of the radiotelephones by which the simultaneous call was carried out answers, facsimile apparatus 101 assigns a link channel and sets up a call. And the user of the side here appears in a radiotelephone 103, and transmits the PRI-Q signal showing the ability to talk over the telephone to the other party facsimile apparatus.

[0056] And by connecting to a radiotelephone 104 the information channel connected to the facsimile modem of a communications control unit 307 so far in step S514 as mentioned above, this connection is not cut and the user of a radiotelephone 104 can telephone to the user of an other party terminal. Thus, actuation of the facsimile apparatus 101 of the above-mentioned example is ended.

[0057] However, if facsimile apparatus 101 recognizes that the radiotelephone which facsimile apparatus 101 connects in step S512 is only one, since it is not necessary to call it by the simultaneous arrival method, in this case, facsimile apparatus 101 establishes a radiotelephone 103, a link channel, and a service channel, may exchange a call setup message and may call them as mentioned above. and the facsimile apparatus 101 -- the response (CONNECT) of a call setup message -- call appearance -- if it receives from a radiotelephone the bottom, it will be judged that the user of a radiotelephone answered.

[0058] On the other hand, it sets to step S513. Facsimile apparatus 101 When not receiving a response, namely, when it starts a timer, and a response (CONNECT) is not received from a radiotelephone 103 although it waits for reception of a response from the called radiotelephone, Or when not receiving a link channel establishment demand from the radiotelephone which carried out the simultaneous call, in step S515, the above-mentioned timer carries out a time-out, and a radiotelephone judges that a user does not answer by the reasons of an absence etc.

[0059] And in step S516, a user is notified of that. That is, although facsimile apparatus 101 displayed the message which means a radiotelephone no response, blinked LED which means cautions, or outputted the error report using the Records Department 306 and called the radiotelephone by LCD of a control panel 304, it notifies a user of it having been a no response. And in step S503, facsimile apparatus 101 usually performs a facsimile procedure, and actuation of the facsimile apparatus 101 of the above-mentioned example ends it.

[0060] The facsimile apparatus as a data communication unit which is connected to the public line of a cable and performs facsimile communication in the 1st example of the above, In the radiotelephone connected with the facsimile apparatus by the PHS wireless circuit, and the radio communications system constituted by these Since it connects during facsimile transmission, the call is connected to a radiotelephone after transmission and a user can do a message with a radiotelephone when a user operates it during facsimile communication It can talk over the telephone by the ability connecting with a radiotelephone easily and the so-called "telephone reservation" function can be realized in the combination of facsimile apparatus and a radiotelephone to perform the message by the radiotelephone as it is by the same call which the facsimile apparatus user is connecting.

[0061] Next, the 2nd example of this invention is explained.

[0062] In the 1st example, although facsimile apparatus 101 is an example which receives telephone reservation actuation during facsimile transmission, the 2nd example is an example which receives telephone reservation actuation during facsimile reception.

[0063] Drawing 7 is drawing showing each actuation of the radiotelephone of the radio communications system which is the 2nd example, and facsimile apparatus, and the signal sequence between equipment devices.

[0064] The configuration of the 2nd example is completely the same as the configuration of the 1st example, and facsimile apparatus 101 is first made into under G3 facsimile reception through a public line 308. That is, the usual G3 facsimile reception is performed according to the ITU advice T.4 and T.30.

[0065] In the 2nd example, a user's push of the "telephone reservation" carbon button on the control panel 304 of facsimile apparatus 101 operates facsimile apparatus 101 in a telephone reservation function after this. The actuation and actuation which specify a radiotelephone are the same as the case of the 1st example.

[0066] As actuation of a telephone reservation function, since facsimile apparatus 101 receives the Q signal specified to the ITU advice T.30 from the facsimile apparatus of the other party after receiving

all or a part of pages of facsimile images, it transmits PIP or an PIN signal to the other party facsimile apparatus, and tells that "telephone reservation" was made. The other party facsimile apparatus carries out singing of the ringing tone, such as a beep sound, from a loudspeaker etc., in order to call the user, if PIP or an PIN signal is received. And in the other party facsimile apparatus, if a user takes the telephone which is attached, for example, as for the other party facsimile apparatus, a reply signal (PRI-Q signal) will be transmitted to facsimile apparatus 101.

[0067] If facsimile apparatus 101 receives a PRI-Q signal, it will judge that facsimile apparatus 101 carried out that the user of the other party facsimile apparatus took telephone etc., and the actuation which calls the user of the side here will be started. That is, one or two or more radiotelephones are called by whether it is registered whether the number which specifies the radiotelephone to call like the 1st example is inputted.

[0068] And facsimile apparatus 101 can transmit PIP showing the ability for the user of the side here to appear in a radiotelephone, and talk over the telephone, if a reply signal is received from the called radiotelephone, or an PIN signal to the other party facsimile apparatus, and can connect the information channel which had connected with the facsimile modem of a communications control unit 307 so far to the radiotelephone which answered, and the user of a radiotelephone 103 can telephone to the user of an other party terminal.

[0069] If a user operates it during facsimile reception or after reception, since the call is connected to a radiotelephone, there is no problem and a user can talk over the telephone with a radiotelephone after facsimile communication in the 2nd example of the above It can connect with a radiotelephone, and can talk over the telephone easily and the so-called "telephone reservation" function can be realized in the combination of facsimile apparatus and a radiotelephone to perform the message by the radiotelephone as it is by the same call which the facsimile apparatus user is connecting.

[0070] Next, the 3rd example of this invention is explained.

[0071] The 3rd example is an example about another actuation of the telephone reservation actuation in facsimile apparatus.

[0072] Although facsimile apparatus 101 identifies that prepared the key special to the control panel 304 of facsimile apparatus 101, and the "telephone reservation" carbon button, and telephone reservation actuation was performed by the depression and the depression of the key of the number of the previous radiotelephone connected for telephone reservation, the 1st example The 3rd example is what can carry out menu selection using an existing actuation key and an existing display. If a telephone reservation menu is chosen by the user during facsimile communication with facsimile apparatus 101, and required and the number of the radiotelephone of a telephone reservation connection place will also be inputted Or if the number of the radiotelephone of a connection place is already registered, as for facsimile apparatus 101, "telephone reservation" actuation will be performed.

[0073] That is, in the 3rd example, since it is not necessary to add a special carbon button, facsimile apparatus 101 is easily realizable only by using ROM302 which built the PHS main phone function in the existing facsimile apparatus, and incorporated the control program of this invention in it further.

[0074] Next, the 4th example of this invention is explained.

[0075] The 4th example is related with still more nearly another actuation of the telephone reservation actuation in facsimile apparatus.

[0076] In the 1st example, it is the example which prepares a carbon button "telephone reservation" key special to the control panel 304 of facsimile apparatus 101, and the 3rd example uses an existing actuation key and an existing display, a telephone reservation menu is prepared, and facsimile apparatus 101 identifies that telephone reservation actuation was performed by the selection.

[0077] The 4th example prepares a microphone and a speech recognition function in facsimile apparatus 101. A user on the other hand, like "telephone reservation of No. 01" If voice input is carried out to a microphone, facsimile apparatus 101 analyzes the information by the speech recognition function, and it can be recognized as the telephone reservation function having been chosen. With facsimile apparatus 101 at the time under facsimile communication A user's input of the above-mentioned voice performs "telephone reservation" actuation which was described in the 1st example. Of course, the number of the radiotelephone to connect may be registered beforehand

and inputting into a microphone is only sufficient for it like "telephone reservation" in this case. [0078] That is, in the 4th example of the above, since an unnecessary key stroke is not needed, the facsimile apparatus in which still more user-friendly telephone reservation actuation is possible can be obtained.

[0079] Next, the 5th example of this invention is explained.

[0080] Drawing 8 is drawing showing each actuation of the radiotelephone of the radio communications system which is the 5th example, and facsimile apparatus, and the signal sequence between equipment devices.

[0081] Automatically [when it talks over the telephone with a radiotelephone first, it reconnects with facsimile apparatus without **(ing) the call by actuation of a user etc. and facsimile transmission or reception is performed], the 5th example is an example which performs telephone reservation actuation, when a user operates it.

[0082] In the 5th example, one [103] of the radiotelephones in the communication system shown in drawing 1, for example, a radiotelephone, presupposes first that it is telephoning to facsimile apparatus and the other party telephone which can be interlocked through facsimile apparatus 101. And when I wish to perform facsimile communication with a partner, with the same call connected, the user of a radiotelephone 103 is the actuation key 210 on a radiotelephone, and performs "call change-over" actuation.

[0083] If this actuation is performed, that will be notified to facsimile apparatus 101, and facsimile apparatus 101 will connect an information channel to the G3 facsimile modem of a communications control unit 307, for example, a radiotelephone 103 will start facsimile transmission. Facsimile coding shall be read and carried out by the read station 305, or data, such as an image which carries out facsimile transmission at this time, shall be stored in RAM303.

[0084] Here, facsimile communication is started, without the other party also cutting a call.

[0085] Termination of facsimile transmission operates facsimile apparatus 101 in a "telephone reservation" function automatically. Concrete actuation is the same as the actuation explained in the 1st example. Moreover, in facsimile reception, it is the same as the actuation explained in the 2nd example. Therefore, if a FAKUSHIMIRIHE call is reconnected from the radiotelephone under message, during facsimile communication, there is no need of performing "telephone reservation" actuation, and "telephone reservation" actuation can be performed automatically here.

[0086] Moreover, when "call change-over" actuation is performed, the number which specifies the radiotelephone connected after facsimile communication may be inputted here. In this case, the radiotelephone which was being first used by the message and a different radiotelephone are specified, and it becomes possible to use it after facsimile communication, connecting.

[0087] Moreover, when "call change-over" actuation is performed, you may enable it to choose by actuation of a radiotelephone whether it reconnects with a radiotelephone automatically, or actuation is ended as it is after facsimile communication here.

[0088] Next, the 6th example of this invention is explained.

[0089] Drawing 9 is drawing showing each actuation of the radiotelephone of the radio communications system which is the 6th example, and facsimile apparatus, and the signal sequence between equipment devices.

[0090] The 6th example is an example which receives a user call signal from the other party facsimile apparatus during facsimile transmission or after transmission.

[0091] When the Q signal was transmitted and the user of the other party facsimile apparatus chooses "telephone reservation" functional actuation after the 6th example presupposed first that facsimile apparatus 101 is facsimile transmitting and facsimile apparatus 101 finished facsimile transmission of a part or all pages, the other party facsimile apparatus transmits PIP or an PIN signal.

[0092] Since this is a signal meaning telephone call appearance, facsimile apparatus 101 performs a radiotelephone call like the 1st example. If it is usual T.30, since the information which specifies the radiotelephone to call is not included in a PIP/PIN signal, if the number of the radiotelephone called to facsimile apparatus 101 is registered beforehand, and that radiotelephone is called and it is not registered at this time, you may make it call the radiotelephones to connect all at once.

[0093] If the called radiotelephone answers, facsimile apparatus 101 receives it, while transmitting

the PRI-Q signal which means that telephone answered to the other party facsimile apparatus, the information channel which had connected with the facsimile modem of a communications control unit 307 so far can be connected to the radiotelephone which answered, and the user of a radiotelephone can telephone to the user of an other party terminal.

[0094] [when a user call signal (here PIP/PIN signal) is received from the other party facsimile apparatus during facsimile transmission or after transmission in the 6th example of the above] If there is no problem, a radiotelephone is called and a radiotelephone answers, since the call is connected to a radiotelephone and a user comes to be able to do a message with a radiotelephone It can talk over the telephone by connecting with a radiotelephone easily to perform the message by the radiotelephone as it is by the same call which the other party facsimile apparatus user is connecting. In the combination of facsimile apparatus and a radiotelephone The so-called "telephone reservation" function is realizable.

[0095] Next, the 7th example of this invention is explained.

[0096] Drawing 10 is drawing showing each actuation of the radiotelephone of the radio communications system which is the 7th example, and facsimile apparatus, and the signal sequence between equipment devices.

[0097] The 7th example is an example which receives a user call signal from the other party facsimile apparatus during facsimile reception or after reception.

[0098] If facsimile apparatus 101 receives a PRI-Q signal after the 7th example's carrying out to facsimile apparatus 101 facsimile being under reception first and finishing facsimile reception of a part or all pages, since this is a signal meaning telephone call appearance, facsimile apparatus 101 will perform a radiotelephone call like the 1st example. If it is usual T.30, since the information which specifies the radiotelephone to call is not included in a PRI-Q signal, if the radiotelephone number is beforehand registered into facsimile apparatus 101, and that radiotelephone is called and it does not register with it at this time, you may make it call the radiotelephones to connect all at once.

[0099] If the called radiotelephone answers, facsimile apparatus 101 receives it, while transmitting the PIP/PIN signal meaning telephone having answered to the other party facsimile apparatus, the information channel which had connected with the facsimile modem of a communications control unit 307 so far can be connected to the radiotelephone which answered, and the user of a radiotelephone can telephone to the user of an other party terminal.

[0100] In the 7th example of the above, if a radiotelephone is called without a problem and a radiotelephone answers during facsimile reception or after reception when a user call signal (here PRI-Q signal) is received from the other party facsimile apparatus, the call will be connected to a radiotelephone and a user can do a message with a radiotelephone.

[0101] Although a data communication unit is used as facsimile apparatus, it remains as it is, the call connected during a G3 facsimile communication link or after a communication link is connected to a radiotelephone and it enabled it to talk over the telephone with a radiotelephone in each above-mentioned example, if it has a telephone call appearance signal during the data communication protocol procedure, each above-mentioned example is applicable with data communication units other than facsimile apparatus.

[0102]

[Effect of the Invention] In the data communication unit which was connected to the public line of a cable according to invention of claim 1 and 15 publications, the radiotelephone connected with the data communication unit by the wireless circuit, and the radio communications system constituted by these Since the data communication unit connected the call to connect to the radiotelephone Talking over the telephone with the radiotelephone connected to the data communication unit the inside of activation of data communication and after activation The effectiveness that redoing call connection, such as carrying out dial actuation again from a radiotelephone, becomes that there is completely nothing in the need is done so for offer to become possible easily by slight reconstruction from the present radio communications system, namely, telephone to the partner same after activation of data communication.

[0103] Since according to invention of claim 2 and 16 publications a data communication unit connects the call to connect to a radiotelephone when a user specifies by the actuation on a data communication unit, users, such as a data communication unit, do so the effectiveness that the call

connected to a data telecommunication system by the actuation is connectable with a radiotelephone, when you like always.

[0104] When reconnecting the call linked to a radiotelephone to a data communication unit according to invention of claim 3 and 17 publications Since a data communication unit connects to a radiotelephone the call connected to a data communication unit during the data communication or after data communication termination When the call linked to a radiotelephone is connected to a data communication unit at the beginning After a data communication unit performs data communication, it comes out easily to reconnect the call to the radiotelephone connected from the first automatically certainly, and there is a data communication unit. For example, a user performs data communication in the middle of the message by the radiotelephone, and does so the effectiveness that it was able to be said that it talked over the telephone again.

[0105] Since according to invention of claim 4 and 18 publications the above-mentioned call change-over actuation is performed when a user specifies by the actuation on a radiotelephone, talking over the telephone by reconnecting a call to a radiotelephone after the data communication by the above-mentioned data communication unit does so the effectiveness of becoming possible by actuation on a user's radiotelephone.

[0106] According to invention of claim 5 and 19 publications, a data communication unit transmits the signal of a user call. After that a data communication unit Since the call to connect can be connected to a radiotelephone when the reply signal of a user call is received With a radiotelephone, in order to talk over the telephone with the user and radiotelephone of partner equipment, especially the user of the data communication unit If the user of the data communication unit of delivery and the other party is called and the user answers the data communication unit of the side here to the other party in a signal with the protocol signal on data communication, or the signal of a side band A specific signal is received from the data communication unit of the other party, and it enables a data communication unit to call the user easily. By namely, transmission and reception of the user call signal and reply signal under data communication The effectiveness that the data communication unit of a communications partner and offer of the message function under data communication and after a communication link which was able to take the synchronization become possible easily is done so.

[0107] According to invention of claim 6 and 20 publications, a data communication unit When facsimile communication can be performed, the PRI-Q signal, PIP signal, or PIN signal of the ITU advice T.30 is transmitted and a PIP signal, an PIN signal, or a PRI-Q signal is received after that Since the call to connect is connected to a radiotelephone, when the data communication unit is equipped with facsimile communication facility, the protocol is used easily, and the effectiveness that the so-called "telephone reservation function" is realizable is done so.

[0108] Since according to invention of claim 7 and 21 publications a data communication unit can connect the call to connect to a radiotelephone when the signal of a user call is received Since especially the user of the data communication unit of the other party talks over the telephone with the radiotelephone connected to the data communication unit after the user of the data communication unit, and activation of data communication A signal from the other party to the data communication unit of the side here with the protocol signal on data communication, or the signal of a side band Delivery, The effectiveness that it becomes possible easily to call the user, namely, offer of the message function under data communication and after a communication link which was able to take the data communication unit of a communications partner and the synchronization by transmission and reception of the user call signal and reply signal under data communication becomes possible easily is done so.

[0109] According to invention of claim 8 and 22 publications, since the call to connect is connected to a radiotelephone when facsimile communication can be performed and the PIP signal, PIN signal, or PRI-Q signal of the ITU advice T.30 is received, a data communication unit does so easily the effectiveness that the so-called "telephone reservation function" is realizable, using the protocol, when the data communication unit is equipped with facsimile communication facility.

[0110] According to invention of claim 9 and 23 publications, it sets to the radiotelephone and data communication unit of the side here, and the data communication unit of the other party. The information which specifies the radiotelephony style of the point which connects a call can be

inputted. A data communication unit Call the specified radiotelephone, and since a call is connected when the called radiotelephone answers The radiotelephone specified as coincidence when it is operated in order to operate a "telephone reservation function" for example, when the extension number was inputted and the data communication actuation by the data communication unit is completed The specific selected radiotelephone is called and the effectiveness that it becomes easy to connect a call is done so.

[0111] When it is operated in order that the information which specifies the previous radiotelephone which connects a call according to invention of claim 10 and 25 publications may operate a "telephone reservation function" since it registers with the data communication unit beforehand, it does not need to input the information which specifies the radiotelephone of the destination of a call one by one, and does so the effectiveness that a call can be connected now to the radiotelephone always same after data communication termination.

[0112] According to invention of claim 11 and 25 publications, a data communication unit If the informational existence which specifies the previous radiotelephone which connects a call is distinguished and the above-mentioned information distinguishes from owner **, since the specified radiotelephone will be called The informational existence which specifies the previous radiotelephone which connects a call can be distinguished easily, and calling certainly the radiotelephone specified when the above-mentioned information has distinguished from owner ** does so easily the effectiveness of being possible.

[0113] According to invention of claim 12 and 26 publications, a data communication unit If the above-mentioned information distinguishes that it is nothing, will call two or more radiotelephones to connect and among the called radiotelephones Since a call is connected to the radiotelephone which answered, it cannot leak, and two or more users can recognize easily that who or a "telephone reservation" function is operating, and two or more users do so the effectiveness that it can talk over the telephone when anyone takes a radiotelephone.

[0114] When there is no information applicable to the information which a data communication unit compares the information which specifies the previous radiotelephone which connects a call with the information registered into the interior of a data communication unit, and registers into the interior of a data communication unit according to invention of claim 13 and 27 publications and it carries out [input / the information in which it made a mistake to a data communication unit] since a data communication unit notifies a user of that, a data communication unit does so the effectiveness that a notice can take out easily to a user.

[0115] According to invention of claim 14 and 28 publications, since a data communication unit notifies a user of that when the called radiotelephone does not answer, the user of a radiotelephone does so the effectiveness that a data communication unit can take out a notice to a user easily, when a radiotelephone does not answer by an absence etc.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing radio communications system CS1 which is the 1st example of this invention.

[Drawing 2] It is the block diagram showing the configuration of the radiotelephone 103 in radio communications system CS1.

[Drawing 3] It is the block diagram showing the configuration of the facsimile apparatus 101 by the 1st example of this invention.

[Drawing 4] It is drawing showing each actuation of the radiotelephone of the radio communications system which is the 1st example, and facsimile apparatus, and the signal sequence between equipment devices.

[Drawing 5] It is a flow chart showing actuation of facsimile apparatus 101.

[Drawing 6] It is a flow chart showing actuation of facsimile apparatus 101.

[Drawing 7] It is drawing showing each actuation of the radiotelephone of the radio communications system which is the 2nd example, and facsimile apparatus, and the signal sequence between equipment devices.

[Drawing 8] It is drawing showing each actuation of the radiotelephone of the radio communications system which is the 5th example, and facsimile apparatus, and the signal sequence between equipment devices.

[Drawing 9] It is drawing showing each actuation of the radiotelephone of the radio communications system which is the 6th example, and facsimile apparatus, and the signal sequence between equipment devices.

[Drawing 10] It is drawing showing each actuation of the radiotelephone of the radio communications system which is the 7th example, and facsimile apparatus, and the signal sequence between equipment devices.

[Description of Notations]

CS1 -- Radio communications system

101 -- Facsimile apparatus

102 -- Public line of a cable,

103-105 -- Radiotelephone,

201 -- Microphone,

202 -- Loudspeaker,

203 -- ADPCM codec,

204 309 -- Channel codec,

205 -- Radio Communications Department,

207 301 -- CPU,

208 302 -- ROM,

210 -- Key switch,

211 -- Display,

304 -- Control panel

305 -- Read station.

[Translation done.]

* NOTICES *

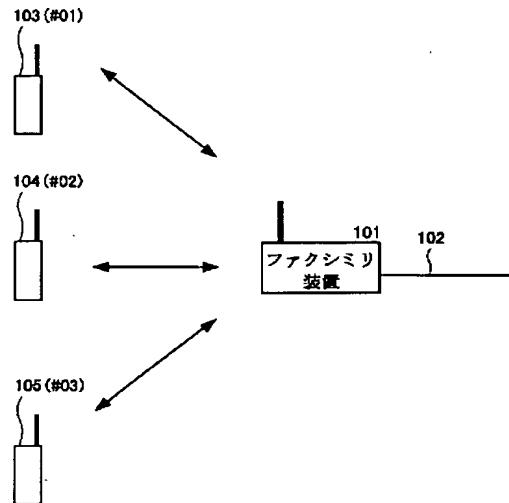
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DRAWINGS

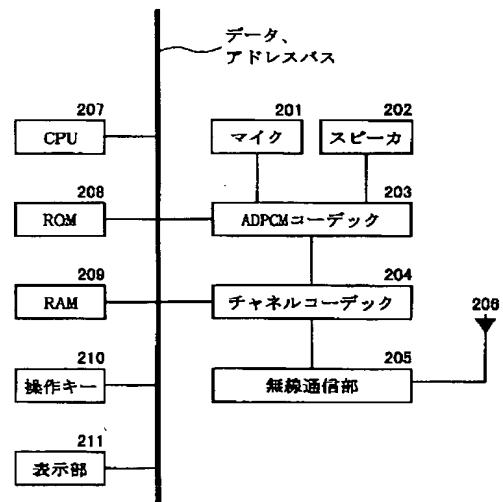
[Drawing 1]

CS1 : 無線通信システム



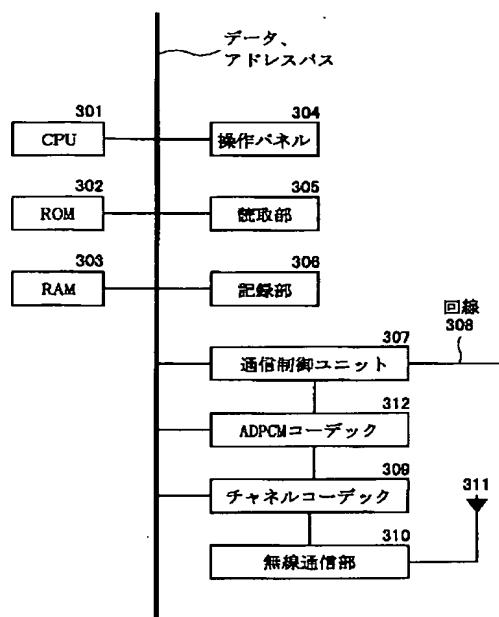
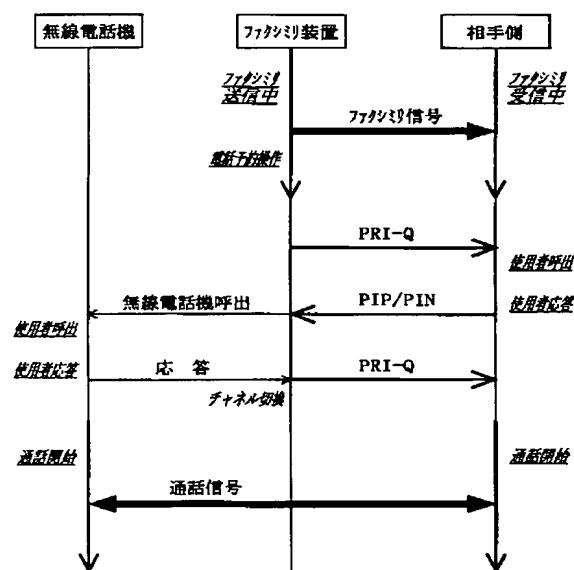
[Drawing 2]

103 : 無線電話機

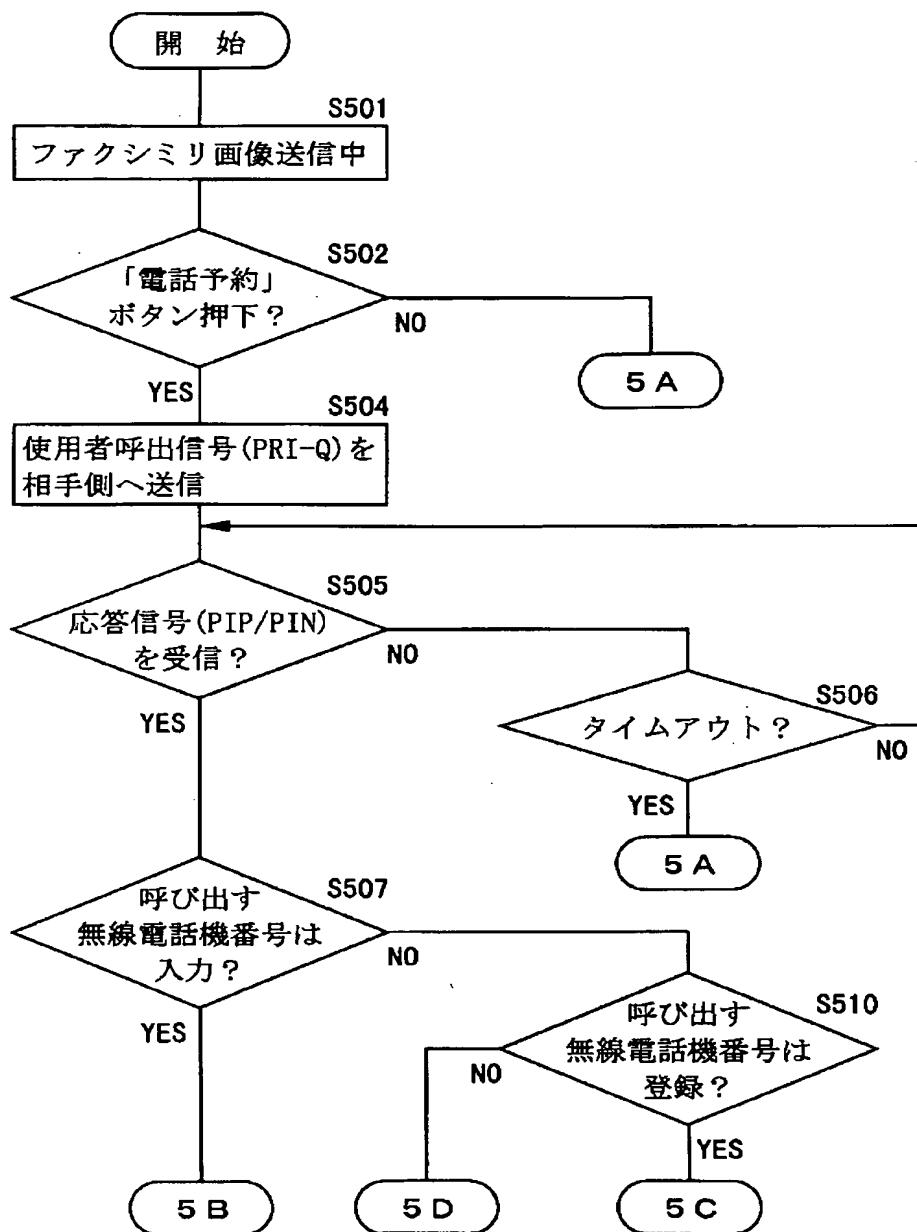


[Drawing 3]

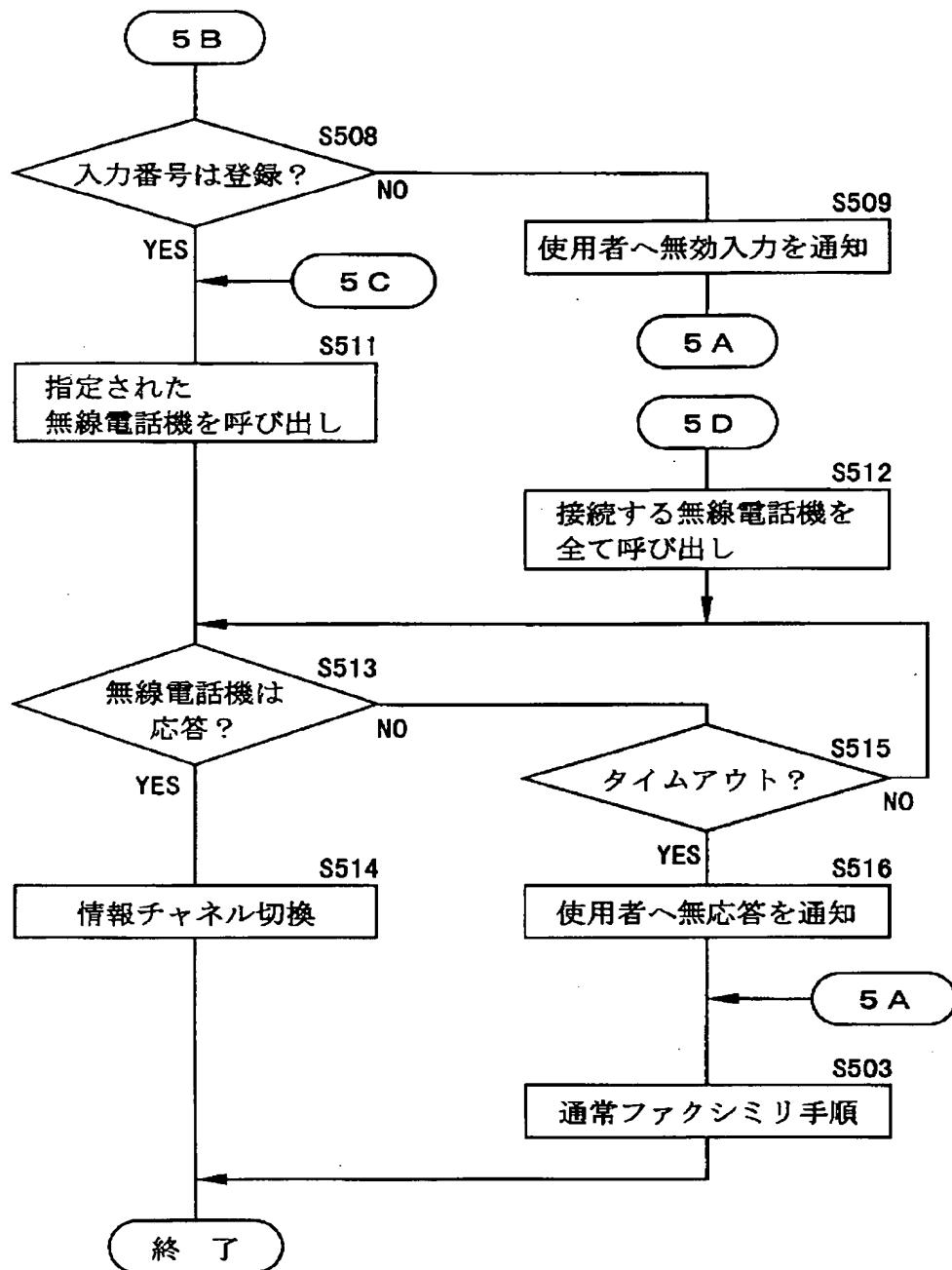
101: ファクシミリ装置

[Drawing 4]
第1の実施例の動作、信号シーケンス

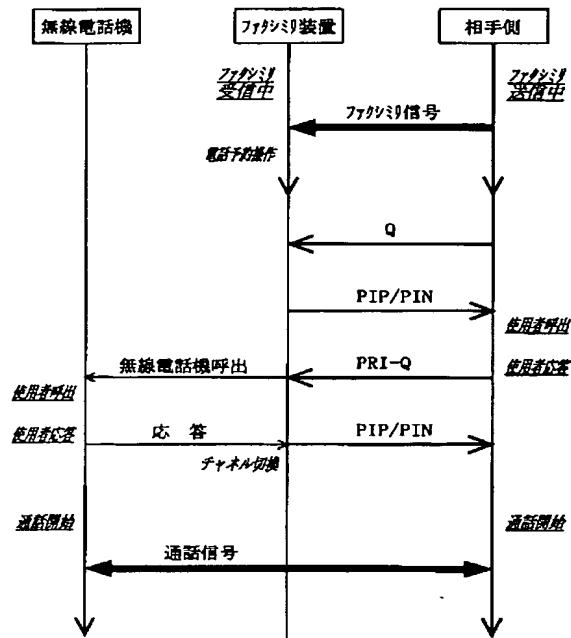
[Drawing 5]

第1の実施例のファクシミリ装置の動作

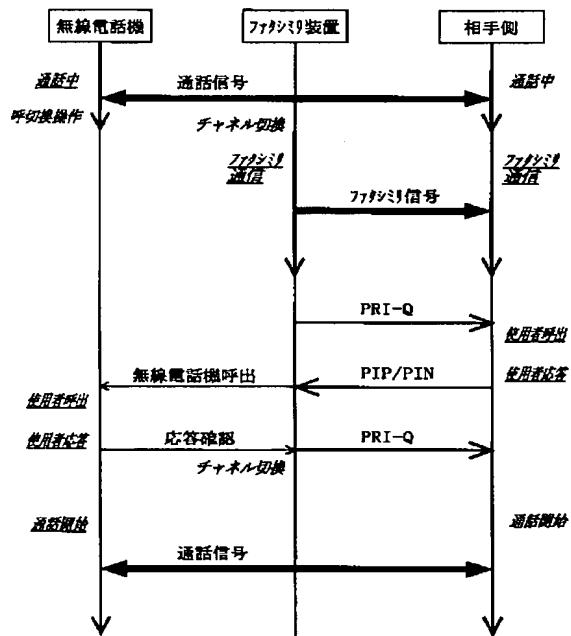
[Drawing 6]



[Drawing 7]

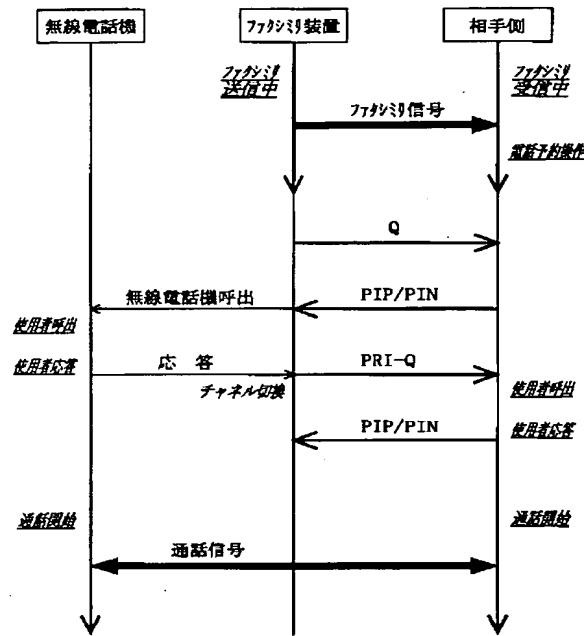
第2の実施例の動作、信号シーケンス

[Drawing 8]
第5の実施例の動作、信号シーケンス



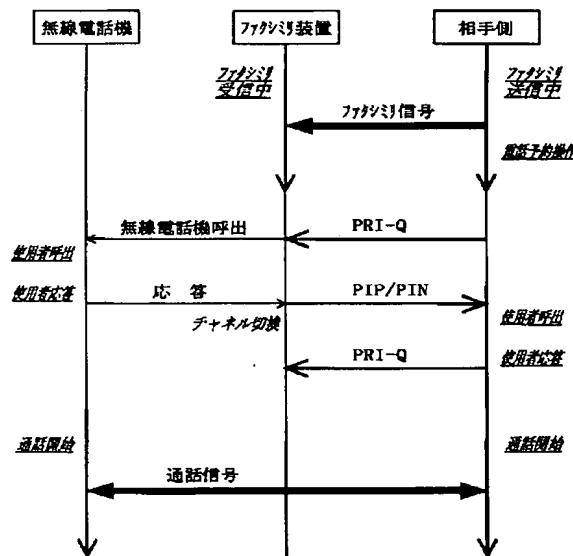
[Drawing 9]

第6の実施例の動作、信号シーケンス



[Drawing 10]

第7の実施例の動作、信号シーケンス



[Translation done.]